

Claims

1. A method of comparing unmasked bits of a data key to a rule, the method including:

dividing the key into chunks,

5 using each of the chunks to obtain a respective address to extract data from a memory, the data stored at the address of the memory corresponding to that chunk of the key being 1 or 0 according to whether a bitwise comparison of that chunk of the data key with the mask is equal to a bitwise comparison of that chunk of the mask and rule; and

10 examining the data extracted for each of the chunks to determine if the rule is obeyed for the entire data key.

2. A method according to claim 1 in which the memory is structured into chunks corresponding to the chunks of the key, and the chunks being grouped into sections, the method including simultaneously for different
15 sections of the memory successively extracting the data for the corresponding chunks within each section.

3. A method of comparing a data key to portions of a plurality of rules, the portions being defined by corresponding masks, the method including:

dividing the key into chunks,

20 successively for each of said rules:

(i) using each of the chunks to obtain an address to extract data from a memory, the data stored at the address of the memory corresponding to that chunk of the key being 1 or 0 according to whether a bitwise comparison of that chunk of the data key with the corresponding mask is equal to a bitwise
25 comparison of that chunk of the corresponding mask and the rule; and

(ii) examining the data extracted from each of the chunks to determine if the rule is obeyed for the entire data key.

4. A method according to claim 3 in which the memory is structured two dimensionally, with a first direction corresponding to the different chunks and
5 a second direction corresponding to the different rules of rules.

5. A system for comparing a data key to portions of a plurality of rules defined by corresponding masks, the system including:

an interface for receiving the key, and dividing the key into chunks,

a memory for receiving the chunks of the key from the interface, and
10 for successive rules, using the chunks of the data key and the rule as address data to extract data indicative of whether a bitwise comparison of that chunk of the data key with the corresponding mask is equal to a bitwise comparison of that chunk of the corresponding mask and the rule; and

a comparator for examining the data extracted from the memory to
15 determine if the rules are obeyed for the entire data key.

6. A system according to claim 5 in which the memory is structured two dimensionally, with a first direction corresponding to the different chunks and a second direction corresponding to the different rules.

7. A system according to claim 5 or claim 6 in which the memory is
20 structured into chunks corresponding to the chunks of the key, the chunks being grouped into sections which are implemented by differing respective memory devices.

8. A system according to claim 6 or claim 7 in which differing respective memory devices store the data in respect of differing groups of the rules.

9. A system according to any of claims 5 to 8 further comprising registers at the interface for storing the key and registers at the comparator for storing the results for different rules.
10. A system according to any of claims 5 to 9 further including switching means for switching the configuration of the system between modes in which there are different respective numbers of bits in each key and different respective numbers of rules.
11. A data switch, such as an Ethernet switch, incorporating a parsing system for extracting a key from received packets, and a system according to any of claims 5 to 10 for classifying the received packets using said key according to the rules.